series of STBs. Certainly, PowerTV will provide most of the OS in SA's OpenCable-compliant Explorer 5000 and other OpenCable set-tops from SA. In a deal with Cox Communications, Liberate will provide the interactive television services on Cox's Explorer 2000 set-tops starting in mid-2000. Although the Explorer 2000 is not an OpenCable-compliant set-top box, it is very likely that Liberate will be involved in some measure with SA's future set-tops. This does not mean PowerTV will not provide the OS, rather that Liberate's software will run on top of PowerTV.

- Sony (Aperios) - It is not possible to mention Sony's Aperios operating system software without mentioning Sony's HAVi (Home Audio-Video interoperability)-based home networking software and Sony's digital cable STBs (see Sony in the hardware vendors section above). In fact, Sony's vision is to connect all of its product lines: its television studios, digital camcorders, its entire list of home appliances including televisions and its OpenCable set-tops. Perhaps most importantly for Sony will be connecting its game consoles to OpenCable boxes. Digital music is another obvious connection for Sony. The company has announced that it would soon begin selling digital music versions of its very popular Walkman. The digital Walkman will certainly benefit from OpenCable's high-speed transport and digital connectivity.
- Liberate Technologies (Liberate) - Formerly called Network Computer Inc. (NCI). Unlike Windows CE, PowerTV, and Aperios, Liberate is not operating system software, rather it is middleware that operates on top of the OS. Liberate's strength lies is its interactive/enhanced television functionality focused on the Internet, which could make it one of the strongest contenders to rule the middleware piece of the OpenCable puzzle. In addition, Liberate provides support for Web-based games and has the support of the major game console companies (its investors include Nintendo, Sega and Sony). Cable operators Cox Communications, Comcast, MediaOne Ventures, Rogers Communications, and Shaw Communications are also investors. Cox has announced it will build interactive television services using Liberate software. The client software will operate on Scientific Atlanta's STBs, which gives Liberate deals with both major U.S. set-top hardware vendors - including General Instrument, one of Liberate's many investors.
- Sun Microsystems (JavaTV) - Elements of Java appear in many forms in OpenCable software from different vendors. JavaTV is Sun Microsystems' TV-centric middleware, which allows content created for one set-top box to be used on any other JavaTV-compatible host-device: "write once, run anywhere." Like Liberate, JavaTV requires an OS to operate. The software is specifically designed for digital television including the ability to create EPGs, interactive multicamera sports events, and most importantly, conditional access applications such as video-on-demand. As is the case with OpenCable, JavaTV is an evolving specification. Much like Microsoft's Windows CE, Java also requires a good deal of memory on STBs.
- OpenTV (OpenTV) - One of the most important software vendors in the European set-top box market, ironically is headquartered in the United States (Mountain View, California). Although this OS may run on digital cable STBs, OpenTV is primarily deployed on satellite-based set-tops, which is consistent with the European market where digital satellite STBs far outnumber those of digital cable. Also consistent with European markets, OpenTV is DVB-compliant. Although OpenTV has some deals for deployment on digital satellite set-tops in the United States (with EchoStar), no digital cable STBs in the United States currently use OpenTV software. Should other European set-top companies such as Pace Micro enter the U.S. market, they are likely to have OpenTV on board.
- Others — These are primarily interactive television application vendors who provide software, possibly some associated hardware such as a keyboards or may simply operate with existing remotes. One example is Wink Communications, which has General Instrument and Scientific Atlanta as investors and whose partners include most major broadcast and cable networks, as well as advertisers.
- B3TV ran the nation's first interactive television commercial in August 1999 via WebTV on a television station in San Francisco. Although B3TV is not active in OpenCable, the company has demonstrated interactive functionality on Scientific Atlanta's Explorer 2000 running PowerTV's software.

Technologies Benefiting From OpenCable

Numerous technologies and companies stand to benefit from OpenCable including many Internet-based businesses. However, there are several technologies that will receive substantial advantages almost immediately:

- Electronic commerce — E-commerce companies will gain far more than incremental revenue increases if OpenCable is widely accepted by consumers, and interactive television applications are actively supported by cable operators. The synergy of endless specialized cable channels, huge bandwidth for Internet access and two-way communications, along with open standards leading to many interactive and enhanced television services could turn OpenCable set-tops into home shopping network hubs. Incidentally, the Home Shopping Network and other current television-based retailers will become more like e-tailers if OpenCable is widely deployed. Interactive television expands revenue-generating possibilities by creating advertisements outside of television's normal commercial breaks or infomercials. Thus, interactive TV has the potential to simultaneously generate content interest and increase sales dollars for vendors, television networks and cable operators alike. Of course the interactive television companies stand to make plenty of money for themselves.
- However, to achieve all of this interactivity, two-way communications must be available via cable. Currently, only 35 to 40 percent of cable operators' physical plants allow two-way communication.
- Digital television (DTV) — OpenCable's combination of tremendous bandwidth and many digital cable channels may promote the adoption of digital television. Despite this, the issue of multiple formats for digital television in the United States is even more daunting than the interoperability issues facing OpenCable. Although more than a dozen separate DTV formats currently exist within the Advanced Television Systems Committee (see ATSC below), only four of those are really important. The issue of progressive versus interlaced scanning is also troublesome, with two of the four broadcast networks supporting each. Until there is standardization and interoperability in the United States., broadcasters and consumers will never fully embrace digital television, even if DTV sets drop to more reasonable price levels. (For more information on digital television issues, see "The Trouble with Digital [Television, That Is"] by Van Baker; September 20, 1999.)
- Video-on-Demand — As mentioned previously, the entire POD security interoperability issue is directly related to video on demand and the ability of cable operators to offer various kinds of pay-per-view programs. Once this interoperability is attained, companies such as DIVA Systems should be able to expand their current deployments. However, video-on-demand via OpenCable goes far beyond the current cable pay-per-view channels. When combined with broadband access, OpenCable expands video-on-demand to the many streaming media technologies on the Internet.
- IP-based applications
    - High-speed Internet access — While Open Cable set-tops provide numerous video applications, where the Internet is concerned, broadband access is certainly the driving force. High-speed access is an ideal front end for home networking as Sony, Philips and the vendors embracing HAVi have no doubt determined. As mentioned, OpenCable STBs are expected to include a cable modem chipset to enable high-speed Internet access.
    - Voice-Over IP — One of the most compelling technologies enabled by OpenCable, voice-over IP offers an opportunity for cable subscribers to place inexpensive long distance calls over the Internet, then pay a combined phone, Internet service, and cable bill. The technology is attractive to both consumers and cable operators. Many MSOs are practically Internet service providers (ISPs) already via their investments in companies such as @Home and Road Runner. Some are calling these entities BSPs, or broadband service providers.
    - IP-based videoconferencing — Once this technology is more widely adopted, OpenCable set-tops could play an important role. The ability to combine video streaming with two-way video (videoconferencing) is an essential element in the future of distance learning, computer-based training, and other interactive video applications. However, communicating with

- family members via videoconferencing could prove to be one of the most popular overall applications for digital cable set-tops.
  - Streaming media — In addition to videoconferencing, OpenCable's MPEG-2 bandwidth will undoubtedly create greater interest in streaming media, particularly video. Wider bandwidth means bigger video windows and far better resolution. OpenCable has the potential to marry videoconferencing, streaming video and dataconferencing as an all-in-one solution for distance learning, computer-based training, corporate meetings and remote-access applications of many kinds.
  - Digital downloads — While electronic commerce will be given a significant overall boost by the numerous interactive and enhanced television services made possible by OpenCable, cable customers making MP3 and digital music downloads should find OpenCable set-tops are excellent transport mechanisms. This also applies to video downloads.
  - Internet-based games — Games played on next-generation game consoles will be significantly enhanced via OpenCable STBs. Sony, in particular will benefit as it produces both OpenCable set-tops and interactive game consoles.

While all of these advanced technologies provide attractive options for OpenCable adopters, it is uncertain whether cable operators will provide the necessary applications to meet all of the possible options for their subscribers. DTV and HDTV, and interactive television, as well as video-on-demand require a good amount of cable headend commitment by the operators to become a reality. Since video-on-demand and interactive television applications are most likely to produce near-term revenue for the MSOs, they are the most likely to be implemented first. Still, as mentioned above, cable operators have a long ways to go in providing the infrastructure necessary to make interactive television a ubiquitous reality.

Competing Technologies and Issues

OpenCable is a specification that has not been completely written or implemented. As a result it is difficult to determine if current technologies are in direct competition with OpenCable. However, digital cable STBs in general, have definite competition. As the OpenCable specification is implemented and potentially increases the proliferation of digital cable STBs in consumer households, it could adversely affect manufacturers of digital satellite STBs and standalone cable modems, as well as digital subscriber line (DSL) vendors, even Internet Service Providers (ISPs) who do not have high-speed access capabilities. OpenCable will provide an all-in-one solution including numerous cable television channels, access to HDTV, high-speed Internet access with a built-in high-speed return path, interactive television services and in many instances, telephony services via the cable line. None of the alternatives allows such broad-based choices. Cable modems and DSL are basically offering high-speed Internet access and Internet-based applications. They do not offer television channels. Digital DBSs offer many TV channels — now including local stations, but do not have a direct return path. With 65 to 70 percent of U.S. households connected to cable television, cable has a huge installed-base advantage over all other technologies.

In theory, cable modems (whether or not they are incorporated into OpenCable set-tops) can offer data transfer rates far above DSLs. Cable's shared data transfer rate goes up to 27 million bits per second (Mbps) versus most DSLs whose top rate is 1.5 Mbps, though some could be higher — up to 11 Mbps. In fact, most DSL transfer rates are in the 256 thousand bits per second (Kbps) range. To DSL's advantage, these rates occur on dedicated lines with only one user per line. This means data transfer rates are stable and do not vary according to the number of subscribers in an area. This is not the case for cable. Cable data services operating on a shared access network could be as high 36 Mbps for the entire network — which is shared in a given neighborhood or geographic area. However, since the cable data pipe is split among multiple simultaneous users, the actual transfer rate for subscribers may be closer to DSL rates at certain times. Conversely, DSL is limited by geography — the farther away from the central office switch, the lower DSL's performance will be. Of course, DSL availability is far less ubiquitous than cable access.

Related Specifications and Standards

Although they are not direct competitors, ATVEF and ATSC remain at odds over the future of advanced interactive television. Both groups say they are not rivals and even claim to be working together. Still, as long as ATVEF and ATSC are promoting incompatible specifications-enhanced television, interactive applications and OpenCable itself face an uncertain future. ATVEF-ATSC incompatibility is related to the endless Microsoft-Sun rivalry.

- ATVEF — The Advanced Television Enhancement Forum (ATVEF), a consortium of more than 75 technology, entertainment, and media companies, is working on a specification for the creation of enhanced and interactive television content. The new ATVEF specification is content-based, HyperText Markup Language (HTML)-based, Web-oriented, with provisions for IP multicasting. ATVEF uses extensions that allow receivers to recognize enhanced content, prepare it for viewing, and transfer files. ATVEF, like Java, employs a write-once paradigm, meaning content need not be rewritten for multiple platforms. Once content based on the ATVEF specification is written, it can be delivered by analog and digital terrestrial, satellite and cable systems and received on any ATVEF-compliant set-top box, digital television, or PC. This eliminates the need to develop multiple versions of programming and content.
- The ATVEF spec should be a driving force for enhanced and interactive services via OpenCable set-tops. CableLabs is one of the founders of ATVEF, indicating that ATVEF-based content should comply with the OpenCable. Interactive television companies Wink Communications, WebTV and Liberate Technologies are already on board with ATVEF. Thus far, ATVEF is not JavaTV-compliant and does not have the support of Sun Microsystems. However, it is strongly supported by Microsoft and Intel, numerous cable multiple service operators (MSOs) and the entertainment industry. While it is uncertain whether Sun will ever participate in ATVEF, PowerTV which already has some HTML-orientation, is likely to bring its software into the ATVEF fold at some point. ATVEF has announced royalty-free licensing of its specification which will speed implementation.
- ATSC (DASE) — the Advanced Television Systems Committee (ATSC) is the North American standards-setting body for digital television applications, while ATVEF is more involved with interactive television via HTML-based applications. The ATSC's group for interactive TV is the DTV Application Software Environment (DASE). DASE and ATVEF are not currently compatible. Reportedly, a coalition of media companies, content providers and consumer electronics vendors will be conducting interactive television trials based on DASE and OpenCable standards in the near future.
- Others — Although they are not deployed in North America and presently are not part of OpenCable, Europe's Digital Video Broadcast (DVB) and Multimedia Home Platform (MHP) standards cannot be ignored. DVB is Europe's digital television standard, while MHP is a set of common application program interfaces (APIs) designed to create OS-agnostic platforms and interactive applications similar to the middleware RFP from OpenCable. DVB in particular influences DTV worldwide and therefore the ATSC in North America.

Dataquest Perspective

why this might not work...

there dev. is ahead of software develop

Cable operators are attempting to comply with requirements set forth by the U.S. Congress and the FCC. Thus, some retail form of OpenCable STBs may be available by July 2000. However, since the development efforts involving hardware elements of OpenCable are far ahead of OpenCable software, the first set-tops are not likely to be fully OpenCable-compliant and may not have completely functional software packages.

Furthermore, availability does not mean adoption. It is uncertain whether all of the issues of

interoperability will be finalized by July 2000. Middleware and copy protection issues must be resolved. The ability of content providers to write interactive applications once — either to ATVEF, DASE, or a combined standard — is crucial. This issue must also be resolved before OpenCable set-tops are widely adopted. If the remaining interoperability issues are all software-related, which is probable, final interoperable software could be provided via software downloads or CD-ROM upgrades. However, it is unlikely cable subscribers will scrap their rental set-top units or straight cable lines in favor of an incomplete solution that requires downloads to be fully operational. If the cable subscribers do not perceive the OpenCable initiative as a value-added service from MSOs, they will not purchase OpenCable STBs. Now that satellite TV services may include local stations, cable operators face even more competition, so getting OpenCable "right" is vital.

Integrating the disparate components of OpenCable into a single, cohesive solution and making a case for that single solution with the cable-viewing public is the key to success for OpenCable. Whether OpenCable leads to widespread retail sales of digital cable STBs immediately is not as important an issue as the interoperability of its many hardware and software elements. Although retail sales trials have been held at Circuit City, so-called "brick and mortar" outlets may not produce all of the OpenCable set-tops' retail sales. Some cable operators and set-top vendors could use a mixed distribution model including direct sales and marketing to cable subscribers in order to facilitate implementation. In most cases, a combination of deals with different retailers (and e-tailers), bundled with discounts on tiers of service such as digital cable upgrades, pay-per-view movies, monthly subscription charges, and interactive bundles as incentives for sign ups will occur as Open Cable set-tops roll out. These tiers of service and variable pricing for OpenCable STBs based their functionality, would provide greater flexibility for MSOs. The MSOs are likely to include other devices (DVD players, personal video recorders from TiVO and Replay, game players and consumer electronic equipment) in conjunction with OpenCable STBs.

OpenCable's retail sales should produce competitive pricing in the digital cable set-top box market. There may be numerous giveaways and promotions, in addition to deep price discounting, if not outright giveaways of OpenCable STBs.

Sony and Cablevision appear to be making an end-run around retail bottlenecks and consumers' reluctance to purchase new cable boxes — problems inherent with the OpenCable rollout. Most likely, Sony and Cablevision will combine to subsidize the deployment of Sony's digital cable STBs in hopes of sharing billions of dollars in revenue from enhanced and interactive services. Different versions of this scenario could be repeated as vendors and cable companies search for ways to get advanced digital cable set-tops into subscribers' homes. However, there is a difference here: Cablevision owns a chain of consumer electronics outlets called "Nobody Beats the Wiz." Cablevision and Sony could easily combine to sell STBs, numerous cable services and Sony's line of home electronics — completely integrating product sales and services at retail locations.

Look for OpenCable STBs to become Integrated Receiver Decoders (IRDs), modules within television receivers, in the future. This is not likely to begin in less than five years.

Just as Microsoft provides a subsidy to keep WebTV prices below $100, Dataquest believes that cable operators and the set-top box vendors must provide various subsidies to their subscribers in order to achieve significant market penetration. Most recent subscriber valuations are reaching upwards of $5,000 in revenue to the cable network operators. Therefore, it can be assumed that a subsidy of up to $500 per unit to get OpenCable set-tops into subscribers' homes will benefit cable operators via increased interactive television service (with associated e-Commerce), video-on-demand, telephony charges, and other fee-based revenue. These subsidies should drop "bare-bones" OpenCable STB prices into the $100 range in order to make the conversion to OpenCable an attractive alternative to current $3 per month rental fees for cable converters. This is an updated version of is an old story in marketing — give away (or discount) the razors,

make a profit on the blades.

Dataquest Recommendations

For participants in the OpenCable process, Dataquest recommends

All Participants in OpenCable

Make OpenCable STBs operate like television sets, not computers. The public will not tolerate set-tops crashing, as is the case with PCs. Devices in the home must have home appliance reliability, even if they contain PC-like hardware and operating system software.

Cable Television Operators

Upgrade their infrastructure to include two-way communications, thus enabling the broadest footprint for interactive television functionality. Cable operators stand to make a good amount of revenue from interactive television services. However, this is impossible if those services are not available because of lack of infrastructure. Finally, this upgrade would increase capacity and also allow more channels to be added to cable lineups, making cable more competitive with satellite TV providers.

Market OpenCable STBs as an attractive all-in-one solution, with one bill coming to subscribers. The cable-viewing public must see the need for OpenCable STBs, if the retail sale of OpenCable STBs is to become a reality. Cable operators and set-top box vendors make deals with retailers on a case-by-case basis with incentives to retailers included. Integrated marketing programs, including bonus discounts to cable subscribers who make purchases at selected retailers, along with co-op advertising (advertising that is paid for by multiple clients all of whom receive mentions in the ads) will be necessary to get OpenCable set-tops into cable subscribers' homes.

Look closely at the Sony/CableVision deal as an early model for rolling out OpenCable STBs. Watch the marketing of these set-tops for possible subsidies and other incentives cable subscribers may receive in exchange for placing these set-tops in their homes.

Cable Set-Top Vendors

Digital cable set-top box manufacturers should ensure that all but their lowest-priced STBs are OpenCable-compliant as soon as is feasible.

Vendors entering the OpenCable retail market must consider their companies' consumer market awareness and must embark on ambitious marketing campaigns to achieve retail sales of their OpenCable STBs. That means all of the hardware vendors. Consumer-oriented companies like Sony and Pioneer need not be as concerned about brand awareness. This may also apply to General Instrument, if GI markets its set-tops under the Motorola brand; and Philips, which markets some of its products under the Magnavox brand. However, Scientific Atlanta has very little recognition in the consumer market. Most European set-top vendors entering the OpenCable market are not likely to have brand recognition here. Very serious and expensive marketing will be required for all but the top consumer brands.

Content Providers

Broadcast and cable companies produce more enhanced and interactive-enabled television programming. Just as there can be no interactive television services without the infrastructure, there can be none without available content.

A combination of ATVEF and DASE-compliant software or JavaTV would provide a strong middleware solution for OpenCable interoperability. This would ensure the strongest combination of interactive television services will be available for OpenCable. Since content creators would only have to write their content once for both ATVEF and JavaTV, interactive television and other enhanced services would certainly gain wider acceptance, furthering the proliferation of OpenCable STBs.

Product Code: MULT-WW-DP-0001

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Features

Bringing Broadband to Retail

Cable modems arrive in a few retail outlets in time for the holidays.

January 11, 2000

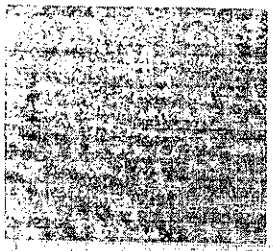
Although only a few retailers were selling cable modems over the holidays, these early efforts provide a glimpse of what is to come. Over the next twelve months, look for standardized CableLabs Certified DOCSIS cable modems to be increasingly stocked on store shelves.

Partnering with cable operator MediaOne, Circuit City is selling DOCSIS cable modems from 3Com and Toshiba in several markets, including Boston, Mass., Richmond, Va. and Atlanta, Ga. The modems are typically priced at $249 with a $50 mail-in rebate, pushing to push the price below $200. Road Runner high-speed cable Internet service from MediaOne is priced at $39.95 per month. For those customers that are not yet ready to buy a modem, MediaOne still offers a lease option for an extra $10 per month. A $99 installation service call from MediaOne is required to activate service, though that fee is waived during promotional periods. More information is available at www.mediaonerr.com.

In suburban New York City, The Wiz is selling 3Com's U.S. Robotics Cable Modem CMX in eight stores for $299. To spur sales, a $200 instant rebate to customers that sign up for a two-year service contract for high-speed Internet service with Cablevision Systems, lowering the modem price to $99. After buying the product, monthly Optimum Online cable modem service is only $29.95 per month for customers that are also basic cable TV subscribers. Cablevision is no longer offering a cable modem lease option for new subscribers.

Importantly, Cablevision and The Wiz are pioneering the use of a self-installation kit that allows new subscribers to immediately activate cable modem service themselves, including installing their own modem and cable outlet, eliminating the need for a cable company service call. The $9.99 kit includes a printed manual, video manual, cable splitter, coaxial cable, and baseboard clips.

"With the self-installation, people like the fact they can get instant gratification. They don't have to take a day off from work waiting for the cable installer. They can decide in the morning they want a cable modem, go to The Wiz, pick it up, and be online surfing later



that day," said Tom Hagopian, vice president, interactive products, Cablevision Systems Corp.

For those customers that don't want to do it themselves, Cablevision still offers installation services, but it's not cheap. The installation of an extra cable outlet is $30, while the cost of PC configuration and cable modem set-up is another $120. More information is at www.optimumonline.com.

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First! via NewsEdge Corporation

TELEVISION DIGEST January 23, 2001

DBS GAINS ON CABLE

TELEVISION DIGEST via NewsEdge Corporation : To no one's great surprise, cable TV remains dominant technology for delivering video programming to consumers, according to 7th annual video competition report released by FCC. Commission said cable had 67.7 million subscribers in June 2000, up one million (1.5%) from 66.7 million in June 1999. DBS continued to make steady inroads into cable's market share, adding almost 3 million subscribers over same period to reach nearly 13 million, up 29% from year earlier. Cable now has 80% of pay-TV market, down from 82% year earlier, while DBS now commands growing 15.4%.

Latest video competition report, which is required by Congress, also said cable rates continued to rise faster than inflation. In June 1999-June 2000 span, cable prices increased 4.8%, compared with 3.2% in Consumer Price Index. But report said MSOs also were spending more than ever, with plant upgrade costs up 89.3% over 1998, network licensing fees up 12.2% and programming expenses up 16.2%. It also said cable operators had responded to "effective competition" in many markets by cutting rates, adding channels, improving customer service, introducing such new services as interactive TV.

FCC said noncable multichannel video programming distributors (MVPDs) together had total of 16.7 million customers last June, up nearly 18% from 14.2 million year earlier. It credited most of increase to rollout of local-into-local service by DBS in last year. Commission said 40 large markets now receive local-into- local from one or both DBS operators, with DirecTV active in 38 markets, EchoStar in 34 and both competing in 32. Both DirecTV and EchoStar now rank among top 8 MVPDs in nation, along with 6 biggest MSOs.

Other cable video rivals were losing ground, Commission said. Wireless cable subscribers slipped 14.7% to 700,000 in June 2000, giving MMDS systems just 0.8% of pay-TV market. C-band satellites fell 17% to 1.5 million as small dishes replaced large ones. Telcos largely began leaving video facilities market, with only BellSouth showing intention of hanging onto its alternative cable systems.

Although FCC has certified 25 open video system (OVS) operators in 50 markets since Telecom Act enactment 5 years ago, new regulatory framework hasn't been popular. Commission said RCN Corp. owns only operating OVS operations in nation, with service in parts of Boston, N.Y.C., San Francisco and Washington areas. Total OVS subscribers remained constant at just 60,000, slightly less than 0.1% of all pay-TV customers.

SMATV, alone among cable rivals, did register growth over last year. FCC said SMATV systems increased their customer base 3.5% to 1.5 million in June. SMATV operators, who mainly serve apartment complexes, now account for 1.8% of MVPD market.

Despite earlier predictions of saturation, overall market for pay-TV continued to grow briskly. Latest video competition report put total MVPD market at 84.4 million households, up 4.4% from 80.9 million in June 1999. Pay-TV penetration of U.S. TV homes edged up 2.4% to 83.8%.

As market grows, cable consolidation continues. Commission said 10 biggest MSOs now serve close to 90% of all cable subscribers and regional cable clusters now cover 44 million (2/3) of cable customers. But vertical integration of national programming services with cable operators slipped again, with top 5 MSOs now controlling 35% of all national networks, down from 37% year earlier. Number of satellite-delivered networks also dipped slightly, to 281 from 283. - FCC didn't meet regulatory flexibility requirements with rulemaking on DTV children's TV obligations

(MM 00-167), Small Business Administration (SBA) said in letter to agency. SBA said it didn't question regulatory goal of improving children's TV, but said Commission "did not describe a vast majority of the compliance requirements... and their impact on small firms. Nor did it discuss significant alternatives." FCC should submit supplemental Regulatory Flexibility Analysis required by Regulatory Flexibility Act, SBA said. Although FCC listed r

ulemaking proposals, SBA said it didn't provide adequate information about costs and alternatives of such proposals as requiring broadcasters to devote 3% of their air time to children's programming. It said that proposal would require broadcasters to add programming whenever they added channels, and FCC didn't provide information about cost of additional programming. SBA raised same questions about other proposals, including technical format rules, menu approach, daily core programming obligation, datacasting, providing content information to publishers and others, preemption rescheduling, commercial tie- in limits. FCC should consider alternatives such as delaying enforcement of rules because of cost to small broadcasters of DTV transition itself, SBA said, as well as setting reduced requirements for small broadcasters that have access to fewer resources. Meanwhile, in comments on rulemaking, state broadcast associations said it was too early to impose "burdensome" children's TV rules on DTV because th

ey "would hamper innovative uses of the digital spectrum." State groups also said FCC didn't have legal right to impose quantitative requirements for programming, and rules would raise First Amendment concerns. Center for Media Education rejected constitutionality argument, Pres. Kathryn Montgomery saying, "The public owns the airwaves, not the broadcasters."

Eight Chris-Craft TV stations will remain UPN affiliates under new agreement announced last week. Stations, which are being bought by News Corp., had been considered possible candidates for switch to Fox network. Deal runs through 2001-2002 TV season. Terms weren't disclosed.

Public broadcasters' DTV transition will produce $779 million shortfall with no funding increases from federal govt., White House said in final Economic Outlook report. PTV made list of "pending policy proposals" -- Clinton Administration budget items that were cut severely by Congress -- after receiving only $44 million of requested $110 million for FY 2001. White House also said FCC's spectrum auction authority had reaped $20 billion since 1994, and failure to renew it past 2008 would cost federal govt. $500 million annually.

Demand for applications will drive growth for public network and enterprise markets, Telecom Industry Assn. (TIA) said in 2001 MultiMedia Telecommunications Market Review and Forecast. Enterprise spending on equipment and software reached $92.1 billion in 2000, and network service providers spending hit $53.2 billion, report said, and despite significant factors creating downward pressure, "we believe there are stronger factors creating upward pressure on spending." Telecom growth factors include growth in supply of bandwidth, which has caused drop in its price and has led to necessity for bundling applications with bandwidth to stimulate usage and increase margins, TIA said. Demand will lead to further investments in bandwidth and will generate new uses such as emerging hosted applications industry and wireless broadband, report said.

FCC turned down petition by advocacy group Rainbow-PUSH Coalition to deny license renewal application of U. of Mo. for noncommercial radio station KWMU(FM) of St. Louis U. for alleged violation of EEO rules, but fined university $8,000 for "willfully omitting" material facts about employment discrimination complaints in information provided to Commission. Rainbow alleged that station had discriminated against several black applicants and former station employees, citing declarations by 2 former staffers and 2 applicants. In order adopted Dec. 20 but not released until Jan. 17, Commission said Rainbow had failed to make prima facie case in its petition to deny.

Broadcasters are averaging 4 hours of children's TV programming per week, one more than FCC's 3-hour guideline, FCC Chmn. Kennard said in letter to Capitol Hill. Letter accompanied

FCC reports on children's TV rules and on DTV public interest standard. On kidvid, Kennard said more still needed to be done, including limiting preemption of children's programming and publicizing availability of shows. On DTV public interest, report listed 11 possible ways for broadcasters to "fulfill their statutory duty to serve the public interest," Kennard said. He said principles should "provide useful guidance" for congressional discussions with broadcasters. Principles cited in report include airing local issue-oriented programs, carrying PSAs, "enriching children," protecting children from harmful programs, "enhancing democracy," providing disaster and emergency information, protecting consumer privacy, making programming accessible to disabled, using technology to enhance service.

Canada's Copyright Board is moving forward on Internet Webcasting tariff that could give legitimacy to such sites as iCraveTV and JumpTV (TVD Oct 30 p8, Oct 2 p7). Board Secy. Gen. Claude Majeau sent letter to parties calling for interim hearings March 12 on JumpTV's application for Internet retransmission tariff. Majeau said hearings would address JumpTV request for interim tariff for offering over-air TV signals on Internet. He asked participants to consider whether board's proposed royalties and interim tariff for 2001 would apply to over-air signals on Internet, even though tariff formula might not exactly suit JumpTV's business model. Majeau said additional considerations are whether board should handle JumpTV's request in fashion similar to proposed prosecution of iCraveTV before Ontario Superior Court and, finally, whether board should certify 2 tariffs, one for Internet retransmissions and another for all other retransmission. JumpTV intends to begin streaming TV broadcast signals this year.

PanAmSat Net36 and Hughes Network Systems (HNS) said Net36 would provide additional streaming content delivery for DirecPC services. With addition of new service, Net36 now has access to half of N. American broadband households via satellite-to-edge servers. Meanwhile, HNS said it was expanding its relationship with Telkom SA Ltd. of S. Africa. HNS will supply Telkom SA with 14,000 very small aperture terminals (VSATs) that will meet 90% of nation's VSAT needs. HNS technology will support delivery of Telkom SA's VSAT service to provide advanced communications systems for election monitoring, air traffic control, rapid financial transactions, multimedia, other services. No terms were disclosed.

FCC released 2000 biennial regulatory review that included details on items that agency accepted for further review that were part of staff report released last fall. FCC Comr. Furchtgott- Roth said he was "heartened" by more detailed analysis in 2000 Biennial Review issued by agency. Review includes staff report that analyzes regulations on "subpart-by-subpart" basis to determine whether they are needed, action that Furchtgott-Roth has championed in past. That level of detail offers "meaningful opportunity for debate about each section of our rules," he said. He urged regulated companies to take active role in commenting on process that he said was "opportunity to keep our regulations consistent with marketplace and technological change."

Fox agreed to stop running ads for Temptation Island following complaint in letter from FCC Comr. Tristani to News Corp. Chmn. Rupert Murdoch. She said "many parents" had complained about ads for show airing during children's viewing hours, saying "children should not be exposed to advertisements for programming that is inappropriate for children."

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First! via NewsEdge Corporation

M2 PRESSWIRE
January 30, 2001

MIPS TECHNOLOGIES/ MIPS Technologies and Hughes Network Systems team to deliver next-generation DIRECTV set-top box systems; Hughes standardize <>

M2 PRESSWIRE via NewsEdge Corporation : MOUNTAIN VIEW, Calif. and GERMANTOWN, Md. -- MIPS Technologies, Inc. (Nasdaq: MIPS, MIPSB) and Hughes Network Systems (HNS), today announced a three-year agreement to design next-generation set-top box DIRECTV systems. Additionally, HNS announced that it has standardized all of its system design activities on the 32-bit MIPS architecture, which includes HNS` wireless networking products.

Under the terms of this agreement, MIPS Technologies will provide HNS with advanced simulation tools in HNS` computing environments, which will significantly speed up the simulation and verification of highly complex system- on-chips (SoCs). These tools speed verification time by up to 160 percent, enabling first-time correct design.

HNS will use the MIPS32 4Kc microprocessor core, which is the industry`s leading core for customer premise equipment in the networking market. HNS will introduce the line of DIRECTV set-top boxes incorporating the MIPS-based SoC in the third quarter of 2001, and will work closely with MIPS Technologies on the design of future platforms. Last summer HNS shipped over five million set-top boxes, a dramatic increase from the one million milestone set in January 1999.

Analysts predict the set-top box market is poised for tremendous growth.

Worldwide projections show the number of digital set-top boxes will grow from 12.1 million in 2000 to 57.1 million in 2006, according to Jon Peddie, president of the research analysis firm Jon Peddie Associates. "MIPS Technologies will be able to leverage its position in the market due to its products` highly agile and flexible architecture, ideally suited for digital set-top boxes," he said. "Teaming up with a market leader like HNS further strengthens that position."

"We believe the MIPS core will give us the power to provide never-before-seen performance and functionality in our next-generation set-top boxes," said Dick Armstrong, vice president of HNS` consumer division. "HNS has shipped more than five million set-top boxes and this arrangement with MIPS Technologies will help us keep our leadership position by enabling us to deliver the best products in the shortest timeframe. MIPS Technologies` highly flexible architecture, its business model and large availability of processor cores for complex SoC designs gives us the ability to provide enhanced product features and to dramatically reduce time to market."

"This is a significant agreement for MIPS Technologies in that we have forged a direct, value-added relationship with one of the world`s largest suppliers of satellite set-top boxes," said John Bourgoin, chairman and CEO of MIPS Technologies. "This partnership demonstrates our flexibility in supporting the unique requirements of a major system OEM customer -- the end users of our technology. By providing critically needed support to HNS, MIPS Technologies has enabled them to reduce their time to market. We believe our community stands to benefit from this proactive business approach, which also speeds up revenue flow to our licensees who supply silicon based on our technology."

About Hughes Network Systems

Hughes Network Systems (HNS) is a leading provider of satellite-based broadband services and applications worldwide. The company's high-speed data services and convergence products include the award-winning DirecPC consumer Internet satellite service, the first-of-its-kind DirecDuo antenna capable of receiving both DirecPC and DIRECTV service, and the high-performance DirecWay platform for multimedia-rich enterprise applications. HNS is also a major manufacturer of receivers and systems for the DIRECTV satellite television service.

HNS, a 2001 winner in the Consumer Electronics Show for Internet Device and Best of Show, and a 2000 Frost & Sullivan Market Engineering Technology Leadership Award for its pioneering efforts in creating the DirecPC product line, is a unit of Hughes Electronics (NYSE: GMH), a subsidiary of General Motors corporation. Hughes Electronics' earnings are used to calculate the earnings per share attributable to the General Motors Class H common stock (GMH). To learn more about HNS, please visit www.hns.com.

About MIPS Technologies, Inc.

MIPS Technologies, Inc. is a leading provider of industry-standard processor architectures and cores for digital consumer and network applications. The company drives the broadest architectural alliance that is delivering 32- and 64-bit embedded RISC solutions. The company licenses its intellectual property to semiconductor companies, ASIC developers, and system OEMs. MIPS Technologies, Inc. and its licensees offer the widest range of robust, scalable processors in standard, custom, semi-custom and application-specific products.

Licensees currently include: Alchemy Semiconductor, Inc., Altera Corporation, ATI Technologies, Inc., Atmel Corporation, Broadcom Corporation, Centillium Communications, Inc., Chartered Semiconductor Manufacturing Ltd., Conexant Systems, Inc., EmpowerTel Networks (formerly known as Lara Technology, Inc.), ESS Technology, Inc., Gemplus International S.A., Integrated Device Technology, (IDT) Inc., inSilicon Corporation, Integrated Telecom Express, (ITeX) Inc., LSI Logic Corporation, Macronix America, Inc., Metalink Ltd., Micron Technology, Inc., General Instrument Corporation (acquired by Motorola, Inc.), NEC Corporation, NeoMagic Corporation, NKK Corporation, Palmchip Corporation, Philips Semiconductors International B.V., Quantum Effect Devices Inc. (acquired by PMC-Sierra Inc.), QuickLogic Corporation, Sandcraft, Inc., SiByte, Inc., Sony Corporation, Synova Incorporated, Taiwan Semiconductor Manufacturing Company, TeraLogic, Inc., Texas Instruments Incorporated, Toshiba Corporation and Excess B

andwidth Corporation (acquired by Virata Corporation). Numerous companies utilize MIPS-based intellectual property. MIPS Technologies, Inc. is based in Mountain View, Calif., and can be reached at 650-567-5000 or www.mips.com.

This press release may contain forward-looking statements regarding future events or the future financial performance of MIPS Technologies, Inc. Actual events or results may differ materially. Many important factors could cause the actual results to differ materially from those contained in such forward- looking statements, including but not limited to the risks that products will fail to achieve market acceptance, the timing of customer orders, delays in the design process, the length of MIPS Technologies' sales cycle, MIPS Technologies' ability to develop, introduce and market new products and product enhancements, the timing of new product announcements and introductions by MIPS Technologies and its licensees and their competitors, the demand for semiconductors and end-user products that incorporate semiconductors and other risks. With respect to MIPS Technologies, Inc. we refer you to the documents that it files from time to time with the Securities and Exchange Commission, including its An

nual Report on Form 10-K for the year ended June 30, 2000 and Form 10-Q for the quarter ended September 30, 2000.

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Instill CORPORATION

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corporate fact sheet

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As an e-business solution-provider focused exclusively on the foodservice industry, Instill Corporation provides its e-business services to an industry ready for change. The food industry is typically divided into two segments: grocery and foodservice, or "food-prepared-away-from-home." As a result of significant demographic trends in North America, including the increase in two-income households, the percentage of meals consumed that are "prepared away from home" is 24% today and growing rapidly. According to the US Department of Commerce, foodservice is a $376 billion industry.

Yet this huge industry, which represents 48% of all retail food sales in the United States, is rife with inefficiencies. On one front in particular—reengineering the supply chain—the foodservice industry has lagged in the adoption of modern technologies. Even as supply chain initiatives have been undertaken with varying degrees of success across other consumer industries—including just-in-time-delivery (JIT) in the auto industry, Quick Response (QR) in the soft goods channel, and most recently Efficient Consumer Response (ECR), which gave us the familiar universal scanner bar coding on all grocery products—foodservice companies have been far slower in deploying automated technologies to streamline their operations.

"The Foodservice Industry can save as much as $6.6 Billion by utilizing electronic commerce initiatives."

--Efficient Foodservice Response Survey

In 1997, the foodservice industry undertook a landmark supply chain study called Efficient Foodservice Response (EFR). The EFR study showed that the foodservice supply chain is burdened with $14.3 billion in non-value-adding costs resulting from the industry's poor technology infrastructure. The EFR report outlined five key strategies that, in combination, could minimize inefficiencies and wasteful practices while enhancing the ability of each stakeholder in the foodservice supply chain to compete fairly and vigorously. Two of those key strategies—E-Commerce and Information—are what Instill Corporation is all about.

The Obstacles

The greatest challenge the foodservice industry faces today is streamlining all areas of the supply chain to improve the profitability of all participants: operators, distributors, and manufacturers. For multi-unit foodservice operators, purchasing food—the number-one raw material for their business—is their most mission-critical, strategic operation. In the low-margin foodservice business, reducing food costs by 1 percent can be equivalent to a 20 percent or more increase in revenue. The 1997 EFR report estimated that streamlining foodservice procurement through e-commerce alone could yield savings of as much as $6.6 billion. Distributors, too, can leverage efficient purchasing initiatives to drive down their costs and compete more effectively.

However, automating the procurement process through e-commerce is only

half of the challenge. More effective and efficient purchasing also requires more valuable as well as increased information. For manufacturers, the challenge lies in obtaining and using solid, reliable information based on actual purchase data—not hunches and guesses—that forms the basis for marketing, promotion, and strategic decisions. To date, that type of information—commonly available in retail/consumer segments—has been absent from the foodservice industry.

A major technical impediment to seamless transaction and information flow between trading partners in the foodservice industry has been a lack of standards for identifying products. In the grocery industry, a bottle of ketchup carries a standard UPC code that is understood and accepted at any point in the supply chain—including any checkout scanner. In the foodservice industry, it's a much different story. For each distributor, an identical bottle or case of Heinz ketchup carries a different product description, manufacturer identifier, product number, pack, and size description. Further complicating matters, there are no standard formats for electronic transaction files within the foodservice industry, making it difficult for operators and distributors to engage in e-commerce activities.

That lack of consistency in product information also presents a major barrier to foodservice manufacturers. Without a single, consistent standard identifier for its products throughout the foodservice channel, manufacturers are stymied in their efforts to track purchasing patterns, market share statistics, promotional activities, and more. Instead of a single SKU, there are dozens of SKUs for identical products, making data aggregation a time-consuming, error-prone nightmare for business analysts.

In order to support a seamless flow within the foodservice supply chain, the industry needs a consolidator or "standardizer" of product and transaction information. However, because of the enormous number of products and the frequency of product turnover, the investment required to build and maintain a standardized catalog of foodservice product information is substantially beyond the means of an individual restaurant chain or operator.

Without unified, multi-distributor purchase management reporting and analysis, foodservice operators cannot

For more information:

- The Efficient Foodservice Response (EFR) initiative involves strategies for vast economic and operational improvements to businesses throughout the foodservice supply chain. View this section for more information on this important industry movement.

proactively manage purchasing activities or move forward with initiatives that positively impact company profitability. And without that data foundation, manufacturers are data-blind—lacking the basic information that other channels routinely use.

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Research Note
Technology
19 February 2001

The Multichannel Content Delivery Opportunity

J. Lundy

Content is the lifeblood of any enterprise. Content delivery via the channel the customer desires is one of the challenges that all enterprises face.

Core Topic

Corporate Publishing ~ Electronic Workplace

Key Issue

What trends will drive corporate publishing strategies during the next five years?

Strategic Planning Assumptions

Through 2003, more than 70 percent of enterprises will leverage their **content** through traditional and new media publishing platforms for more-efficient distribution (0.7 probability).

By YE04, 40 percent of corporate **content** will support **delivery** over at least three different channels instead of the single or dual channels used in 2001 (0.7 probability).

Content is important for enterprises, and Web **content**, in particular, is becoming increasingly important. Whether it is Web **content** or **content** delivered via e-mail or in printed form, getting **content** delivered is a mission-critical process for most enterprises. Delivering this **content** via these multiple channels is often managed by separate organizations. In today's economy, those models are becoming outdated. We discuss the business implications of multichannel **delivery**.

The Case for Multichannel Delivery: Most enterprises publish **content** using fixed, independent processes for each targeted channel, be it Web, print, electronic, audio or video. The advent of the Web is forcing many companies that deliver business information in hard copy to also be capable of delivering that **content** electronically. For many of these enterprises, legacy processes make it difficult to develop an integrated process that allows one set of **content** to be delivered via multiple channels.

Over time, the cost to maintain separate processes that produce separate deliverables will become cost prohibitive. Thus, enterprises that need to reduce costs and streamline their

business processes will have to leverage **content** to deliver it using automated processes in multiple formats. Through 2003, more than 70 percent of enterprises will leverage their **content** through traditional and new media publishing platforms for more-efficient distribution (0.7 probability).

The Single-Channel Approach: Enterprises often offer their **content** via multiple channels (Web, hard copy, audio or video), but the channels are often not integrated, which creates redundancies in **content**-creation processes as well as in the **content**. For example, the group responsible for electronic statement presentment often does not interact with the group that is printing those statements. Coordinating the activities between these groups might simplify the process to be used and thus eliminate redundancies.

The Organizational Dilemma: Single-**content delivery** is not integrated with other channels. This **content delivery** problem is often due to the organization structure within an enterprise. Because **content** permeates every aspect of an enterprise, it is natural for differences in approach to occur. To bring more cohesiveness to **content delivery**, enterprises should appoint a **content** strategist (see Note 1). The **content** strategist is the chief person who works with the IS organization and the lines of business to make sense of **content** and to streamline processes involved with the formatting and **delivery** of **content** in the multiple forms.

Note 1

The Content Strategist

The "**content** strategist" — a Gartner concept — provides the critical nexus for identifying, managing and executing strategic positioning as new media projects become key parts of the e-business equation. The person must understand the business opportunities that new media projects will enable. In managing executive sponsorship, the **content** strategist plays the critical role of communicating a project's progress and strategic potential. The individual must be adept at closing the gap between business unit and IS organization interests.

Channel Choices: Content delivery channels vary, and in many cases may take several different forms in the same channel. These include hard copy, Web, voice, e-documents and video/interactive TV.

Hard Copy: Paper documents are still a popular **content delivery** choice. This is more of a push methodology and is still preferred in the business-to-consumer (B2C) environment, where enterprises need to send documents (e.g., statements, bills) to their customers. An increasing majority of those who produce paper documents are beginning to offer those documents electronically, often as a document that customers can access via password control on a Web site.

Web: It seems that almost everyone has a Web site, and moving **content** to the Web is one of the highest priorities. Another issue is ensuring that **content** is secure and viewable by only the individuals or groups that should have access to it. One of the reasons that groups are reluctant to outsource their statement presentment operations is the fear of losing valuable data to a competitor.

Voice Portal: Voice access has been around on mainframe computers for years. However, voice access to **content** is really what will open up Web sites to the masses. While this may be a secondary priority for some, for others, particularly those who want to conduct e-business, enabling access via phone is an important step. Voice portals will be important for the B2C space, including consumer portals (e.g., "AOL anywhere") and vertical applications (e.g., stock trading). In the business-to-business (B2B) space, voice portals have yet to take off.

E-Document as an E-Mail Attachment: Delivering **content** via e-mail has become very popular, and it will continue to be a way to deliver standard and custom **content** to specific individuals or groups. As mail forwarding services come into play, more and more documents will be delivered electronically instead of in hard copy.

Video/Interactive TV: A picture is worth a thousand words. Adding streaming media to a Web site can enhance the value of the **content**, especially for enterprises targeting corporate users and their high-bandwidth connections. Interactive TV has the potential to totally change the advertising world, as it will blend the Web and television. While interactive TV has not reached critical mass, it will be a **delivery** channel that will move beyond early-adopter status by YE02.

Developing a Multichannel Approach: Originally, multichannel output, also referred to as distributed output management (DOM), was thought of as having the capability to take print streams and manage the **delivery** of those streams to printers, fax machines, e-mail attachments or HTML files delivered to a Web site (see Note 2). DOM products can support **delivery** to different types of devices, including personal digital assistants (PDAs) and cell phones (see Note 3), something that Web **content** management vendors are also beginning to support. DOM tends to focus on the **delivery** of mission-critical documents, whereas Web **content** management focuses on general Web-based **content**. However, DOM technology can enhance a Web site by enabling multichannel publishing directly on that site (see Note 4).

Note 2

DOM Defined

DOM is middleware that drives the output process and supports the automated creation and **delivery** of business process and ad hoc documents. DOM key capabilities include the ability to deliver documents to printers, to fax machines, or electronically via e-mail or Web servers. DOM applications can print selectively, based on user requirements, which may dictate electronic **delivery** instead of hard copy. DOM has been used extensively to support enterprise resource planning installations, mainframe and client/server integration and, increasingly, e-business document-intensive environments. DOM is an approximately $560 million market that is growing at 35 percent compound annual growth rate.

Note 3

The Impact of Wireless

Wireless communication will enable **content** to travel more freely to a wider variety of devices. For multichannel **delivery**, this means being able to support extra protocols such as Wireless Access Protocol (WAP) and Wireless Markup Language (WML).

Note 4